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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MERKLING, MATTHEW J	
ART UNIT	PAPER NUMBER
1709	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/766,469	ZAUNER, GUNTER	
	Examiner	Art Unit	
	Matthew J. Merkling	1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/29/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1-6, 8, 10-14 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reck et al. (US 6,689,327) in view of Presz, Jr. et al. (US 5,110,560).

Regarding claim 1, Reck discloses:

A catalytic converter device (Fig. 7) for cleansing exhaust gas emitted from an internal combustion engine (abstract), comprising:

an elongated body (Fig. 7) having a longitudinal axis;

an inlet area (col. 5 lines 28-31) located at one end of the elongated body (Fig. 7); and

a sleeve extending from the inlet area (8), wherein the sleeve has a catalytic material formed thereon (col. 4 lines 52-55), wherein the sleeve has an active surface for reacting with the exhaust gas (col. 4 lines 52-55), wherein a size of the active surface increases as a distance from the inlet area increases (see Fig. 7), wherein the sleeve includes at least one depression formed therein (see Fig. 7, sleeve 8), wherein the sleeve without the at least one depression (taken at the apex of the corrugations

in sleeve 8) has a first internal cross section, wherein the sleeve having the at least one depression has a second internal cross section (taken at the troughs of the corrugations in sleeve 8), wherein the second internal cross section is smaller than said first internal cross section,

Reck fails to teach the depression having a depth that increases as the distance from the inlet area increases.

Presz, Jr. also discloses a catalytic converter device with a diffuser immediately upstream (col. 2 lines 25-34).

Presz, Jr. teaches a diffuser (Fig. 5) wherein the depth of the depressions (322) increase as the distance from the inlet increases (col. 8 lines 47-50). This configuration is preferable in order to allow greater diffusion of the exhaust gas than would be possible for the same diffuser without these depressions (col. 8 lines 57-64).

It would have been obvious to one of ordinary skill in the art to use the diffuser with increased depression depth coinciding with increasing length from the inlet of Presz, Jr. with the sleeve of Reck in order to allow greater diffusion of the exhaust gas into the catalytic converter.

Regarding claim 2, Reck, as discussed in claim 1 above, further discloses the sleeve (Fig. 3, (2)) having a plurality of openings (5) formed therein.

Regarding claim 3, Reck, as discussed in claim 2 above, further illustrates the openings (5) extending across the active surface (Fig. 3).

Regarding claim 4, Presz Jr. further discloses a diffuser (Fig. 5) wherein the depressions (322) extend in a parallel direction to the longitudinal axis (302).

Regarding claim 5, Reck, as discussed in claim 1 above, further illustrates the depressions (see Fig. 7) arranged at regular intervals on the sleeve.

Regarding claim 6, Reck, as discussed in claim 8 above, further discloses that at the end of the sleeve opposite the inlet area, the active surface has a perimeter in a plane that is perpendicular to the longitudinal axis (Fig. 7).

Reck fails to teach:

> an internal cross-sectional area of the sleeve in a plane that is perpendicular to the longitudinal axis is at least about 5 % smaller than an area of a circle having an equally long perimeter, and
>
> the circle has a diameter that is larger than a width of the sleeve.

Presz, Jr. teaches that in a cross sectional area of the sleeve (Fig. 5) in a plane perpendicular to the longitudinal axis (302), the ratio of 'wavelength' (peak to peak arc length, X) of the curvature of the peaks (320) and 'amplitude' (peak to trough height, Z) of the curves (Fig. 6, (Z)), $^{X}/_{Z}$, is preferably greater than 0.2 and less than 4 which corresponds to a greater than 5% difference in the area of the cross sectional internal area and the area of a circle with the same perimeter. This ratio also shows that the diameter of the circle is larger than the width of the sleeve. Presz, Jr. teaches this in order to prevent excessively increasing backpressure on an engine feeding the catalytic converter (col. 6 lines 21-48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the sleeve shape of Presz, Jr. to the sleeve of the modified Reck in order to prevent excessively increasing backpressure on an engine.

Regarding claim 17, Reck discloses:

an elongated body (Fig. 7) having a longitudinal axis;

an inlet area (col. 5 lines 28-31) located at one end of the elongated body (Fig. 7); and

a sleeve extending from the inlet area (Fig. 7) and having an inner surface that is at least partially coated with a catalytic material that defines an active surface for reacting with the exhaust gas (col. 4 lines 52-55), wherein a perimeter of the active surface in a plane that is perpendicular to the longitudinal axis increases as the sleeve extends away from the inlet area (See Fig. 7).

Reck fails to disclose:

an internal cross-sectional area of the sleeve in at least one plane that is perpendicular to the longitudinal axis is at least about 5% smaller than an area of a circle having a perimeter equal to the perimeter of the active surface in the at least one plane.

Presz, Jr. discloses that in a cross sectional area of the sleeve (Fig. 5) in a plane perpendicular to the longitudinal axis (302), the ratio of 'wavelength' (peak to peak arc length, X) of the curvature of the peaks (320) and 'amplitude' (peak to trough height, Z) of the curves (Fig. 6, (Z)), $^{X}/_{Z}$, is preferably greater than 0.2 and

less than 4 which corresponds to a greater than 5% difference in the area of the cross sectional internal area and the area of a circle with the same perimeter. Presz, Jr. teaches this in order to prevent excessively increasing backpressure on an engine feeding the catalytic converter (col. 6 lines 21-48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the sleeve shape of Presz, Jr. to the sleeve of the modified Reck in order to prevent excessively increasing backpressure on an engine.

Regarding claims 18 - 20, Reck, as discussed in claim 17 above, discloses all of the claims limitations but fails to teach:

the end of the sleeve opposite the inlet area, the circle has a diameter that is larger than a width of the sleeve,

the perimeter of the surface of the sleeve is non-circular at a longitudinal position where the perimeter increases as the sleeve extends away from the inlet area, and

a cross-sectional shape of the surface of the sleeve varies as the sleeve extends away from the inlet area.

Presz, Jr. discloses that the circle has a diameter that is larger than the width of the sleeve (Fig. 6), that the perimeter of the surface of the sleeve is non-circular (Fig. 6) and the perimeter increases as the sleeve extends away from the inlet area (Fig. 6), and a cross sectional shape of the surface of the sleeve varies as the sleeve extends away from the inlet area. Presz, Jr. teaches this configuration of the sleeve in order to allow greater diffusion of the exhaust gas

than would be possible for the same diffuser without this configuration (col. 8 lines 57-64) and to prevent boundary layer separation of the exhaust gas (col. 6 lines 21-26).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the configuration of the sleeve in Presz, Jr. with the sleeve of Reck in order to allow greater diffusion of the exhaust gas than would be possible for the same diffuser without this configuration, and also to prevent boundary layer separation of the exhaust gas.

Regarding claim 8, Reck discloses an exhaust system (Fig. 7) for an internal combustion engine comprising:

A flow path for exhaust gas emitted from an internal combustion engine (Fig. 7, abstract),

a primary catalytic converter device (Fig. 7, (9)) for cleansing exhaust gas emitted from an internal combustion engine (abstract), comprising:

an elongated body (Fig. 7) having a longitudinal axis;

an inlet area (col. 5 lines 28-31) located at one end of the elongated body (Fig. 7); and

a sleeve extending from the inlet area (8), wherein the sleeve has a catalytic material formed thereon (col. 4 lines 52-55), wherein the sleeve has an active surface for reacting with the exhaust gas (col. 4 lines 52-55), wherein a size of the active surface increases as a distance from the inlet area increases (see Fig. 7), wherein the sleeve includes at least one

depression formed therein (see Fig. 7, sleeve 8), wherein the sleeve without the at least one depression (taken at the apex of the corrugations in sleeve 8) has a first internal cross section, wherein the sleeve having the at least one depression has a second internal cross section (taken at the troughs of the corrugations in sleeve 8), wherein the second internal cross section is smaller than said first internal cross section (Fig. 7).

Reck fails to teach the depression having a depth that increases as the distance from the inlet area increases.

Presz, Jr. discloses a diffuser that is placed on the inlet to a catalytic converter (col. 2 lines 25-34).

Presz, Jr. teaches a diffuser (Fig. 5) wherein the depth of the depressions (322) increase as the distance from the inlet increases (col. 8 lines 47-50). This configuration is preferable in order to allow greater diffusion of the exhaust gas than would be possible for the same diffuser without these depressions (col. 8 lines 57-64).

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the sleeve of Reck with the diffuser with increased depression depth coinciding with increasing length from the inlet of Presz, Jr. in order to allow greater diffusion of the exhaust gas into the catalytic converter.

Regarding claim 10, Reck, as discussed in claim 8 above, further discloses the sleeve (Fig. 3, (2)) having a plurality of openings (5) formed therein.

Regarding claim 11, Reck, as discussed in claim 10 above, further illustrates the openings (5) extending across the active surface (Fig. 3).

Regarding claim 12, Reck, as discussed in claim 8 above, further illustrates (Fig. 7) the second internal cross section area changes as the distance from the inlet area increases.

Regarding claim 13, Reck, as discussed in claim 8 above, discloses all of the claim's limitations, but fails to teach each of the depressions extending in a parallel direction to the longitudinal axis.

Presz Jr. teaches a diffuser (Fig. 5) wherein the depressions (322) extend in a parallel direction to the longitudinal axis (302). This configuration is preferable in order to allow greater diffusion of the exhaust gas than would be possible for the same diffuser without this configuration (col. 8 lines 57-64).

It would have been obvious to one of ordinary skill in the art to replace the sleeve of the modified Reck with the diffuser with depressions parallel to the longitudinal axis of Presz, Jr. in order to allow greater diffusion of the exhaust gas.

Regarding claim 14, Reck, as discussed in claim 8 above, further illustrates the depressions (see Fig. 7) arranged at regular intervals on the sleeve.

Regarding claim 16, Reck, as discussed in claim 8 above, further illustrates that at the end of the sleeve opposite the inlet area, the active surface has a perimeter in a plane that is perpendicular to the longitudinal axis (Fig. 7).

Reck fails to teach:

an internal cross-sectional area of the sleeve in a plane that is perpendicular to the longitudinal axis is at least about 5 % smaller than an area of a circle having an equally long perimeter, and

the circle has a diameter that is larger than a width of the sleeve.

Presz, Jr. teaches that in a cross sectional area of the sleeve (Fig. 5) in a plane perpendicular to the longitudinal axis (302), the ratio of 'wavelength' (peak to peak arc length, X) of the curvature of the peaks (320) and 'amplitude' (peak to trough height, Z) of the curves (Fig. 6, (Z)), $^{X}/_{Z}$, is preferably greater than 0.2 and less than 4 which corresponds to a greater than 5% difference in the area of the cross sectional internal area and the area of a circle with the same perimeter. This ratio also shows that the diameter of the circle is larger than the width of the sleeve. Presz, Jr. teaches this in order to prevent excessively increasing backpressure on an engine feeding the catalytic converter (col. 6 lines 21-48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the sleeve shape of Presz, Jr. to the modified Reck in order to prevent excessively increasing backpressure on an engine.

3. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reck and Presz, Jr. as applied to claims 1 and 8 above, and further in view of Gieshoff et al. (5,934,073).

Regarding claims 7 and 15, Reck, as discussed in claim 1 and 8 above, further discloses the sleeve (Fig. 7) has an opening formed in an end of the sleeve opposite the inlet area (See Fig. 7).

Reck fails to teach the catalytic converter device further comprising a cover plate covering the opening.

Gieshoff also discloses a catalytic converter device for purifying exhaust gas from an internal combustion engine (abstract).

Gieshoff teaches a cover plate (Fig. 2 (13)) on the end of a sleeve opposite the inlet (Fig. 2 (2')) in order to force exhaust gas to flow radially outward past catalyst (4') (paragraph 24, lines 9-11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the coverplate of Gieshoff to the sleeve of the modified Beck, in order to force exhaust gas radially outward past the catalyst.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reck and Presz, Jr. as applied to claim 8 above, and further in view of Hosoda (JP 05-86843).

Regarding claim 9, the modified Reck, as discussed in claim 8 above, discloses all of the claim's limitations, but does not teach the preliminary catalytic device being arranged at least partially within the muffler/housing.

Hosoda also discloses a catalytic system with a preliminary catalytic device used to treat exhaust gas from an internal combustion engine.

Hosoda teaches a preliminary catalytic device (Fig. 1 (27)) that is partially within the muffler/housing (21). Hosoda teaches this in order to ensure than all gas that passes to a main catalytic converter (26) must pass through the preliminary catalytic device so the temperature is raised to the proper operating temperature of the main catalytic device (paragraph 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to install the preliminary catalytic device of the modified Reck partially within the muffler/housing as in Hosoda, in order to ensure than all gas that passes to the main catalytic converter must pass through the preliminary catalytic device so the temperature is raised to the proper operating temperature of the main catalytic device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Merkling whose telephone number is 571-272-9813. The examiner can normally be reached on Monday - Friday 8:30-4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa D. Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJM

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SUPERVISORY PATENT EXAMINER